



Downstream Power Tilt

The Downstream Power tilt feature is used to correct cable loss in the head-end to produce a flat power spectrum for all channels in the controller port.

- [Hardware Compatibility Matrix for the Cisco cBR Series Routers, on page 1](#)
- [Information about Downstream Power Tilt, on page 2](#)
- [How to Configure the Downstream Power Tilt, on page 3](#)
- [Feature Information for Downstream Power Tilt, on page 4](#)

Hardware Compatibility Matrix for the Cisco cBR Series Routers



Note The hardware components that are introduced in a given Cisco IOS-XE Release are supported in all subsequent releases unless otherwise specified.

Table 1: Hardware Compatibility Matrix for the Cisco cBR Series Routers

| Cisco CMTS Platform | Processor Engine | Interface Cards |
|--|--|--|
| Cisco cBR-8 Converged Broadband Router | <p>Cisco IOS-XE Release 16.5.1 and Later Releases</p> <p>Cisco cBR-8 Supervisor:</p> <ul style="list-style-type: none"> • PID—CBR-SUP-250G • PID—CBR-CCAP-SUP-160G • PID—CBR-CCAP-SUP-60G • PID—CBR-SUP-8X10G-PIC | <p>Cisco IOS-XE Release 16.5.1 and Later Releases</p> <p>Cisco cBR-8 CCAP Line Cards:</p> <ul style="list-style-type: none"> • PID—CBR-LC-8D30-16U30 • PID—CBR-LC-8D31-16U30 • PID—CBR-RF-PIC • PID—CBR-RF-PROT-PIC • PID—CBR-CCAP-LC-40G • PID—CBR-CCAP-LC-40G-R <p>Cisco cBR-8 Downstream PHY Modules:</p> <ul style="list-style-type: none"> • PID—CBR-D30-DS-MOD • PID—CBR-D31-DS-MOD <p>Cisco cBR-8 Upstream PHY Modules:</p> <ul style="list-style-type: none"> • PID—CBR-D30-US-MOD • PID—CBR-D31-US-MOD |

Information about Downstream Power Tilt

The downstream power tilt feature is used to correct cable loss in the head-end to produce a flat power spectrum for all channels on the controller port.



Note There may be noise floor degradation on the failover path (following linecard switchover) with this feature enabled.

Restrictions for Configuring Downstream Power Profile

The downstream power tilt feature and OFDM power profile feature are mutually exclusive. They cannot be configured at the same time.

How to Configure the Downstream Power Tilt

Configuring Downstream Power Tilt

Downstream power tilt applies to all the SCQAM or OFDM channels on the downstream. To configure downstream power tilt for a controller port, use the power-tilt configuration command under the downstream controller port.

```

enable
configure terminal
controller Integrated-Cable slot/subslot/port
max-ofdm-spectrum value
max-carrier value
base-channel-power value
power-tilt mode loss max-frequency freq-max
rf-chan start_id [end_id]
type value
rf-output value
power-adjust value
qam-profile id
docsis-channel-id id
ofdm channel-profile id start-frequency value width value [plc value]

```

Below is an example:

```

controller Integrated-Cable 3/0/0
  max-ofdm-spectrum 192000000
  max-carrier 32
  base-channel-power 34
  power-tilt linear 4.0 max-frequency 696000000
  rf-chan 0 31
    type DOCSIS
    frequency 261000000
    rf-output NORMAL
    power-adjust -2.0
    qam-profile 1
    docsis-channel-id 1
  rf-chan 158
    power-adjust 0
    docsis-channel-id 159
  ofdm channel-profile 20 start-frequency 600000000 width 96000000 plc 645000000

```

In the above configuration steps, there is a command **power-tilt mode loss max-frequency freq-max**, where the *mode* represent a formula that calculates the loss of a coax cable at a frequency F, given the loss at *freq-max* is known. It provides two options to select:

- linear: $\text{loss}_F = \text{loss}_{\text{freq-max}} * (F / \text{freq-max})$
- cable-loss-approx: $\text{loss}_F = \text{loss}_{\text{freq-max}} * \text{SQRT}((\text{freq-max} - F) / \text{freq-max})$

loss is the measured cable loss at *freq-max*, specified in 1/10 dB.

Verifying Downstream Power Tilt Configuration

To display the downstream power tilt details, use the **show cable controller integrated-cable** command as given in the following example. This command will display the actual SCQAM and OFDM channel power levels as set by the DS Power Tilt command. For OFDM channels, the power level displayed represents the center frequency 6-MHz band power level.

```
Router# show controller Integrated-Cable 1/0/1 rf-chan 0-162
```

| Chan | State | Admin | Frequency | Type | Annex | Mod | srate | Interleaver | dcid | power | output |
|------|-------|-------|-----------|--------|-------|-----|-------|-------------|------|-------|--------|
| 0 | UP | UP | 261000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 1 | 29.9 | NORMAL |
| 1 | UP | UP | 267000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 2 | 30.0 | NORMAL |
| 2 | UP | UP | 273000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 3 | 30.0 | NORMAL |
| 3 | UP | UP | 279000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 4 | 30.0 | NORMAL |
| 4 | UP | UP | 285000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 5 | 30.1 | NORMAL |
| 5 | UP | UP | 291000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 6 | 30.1 | NORMAL |
| 6 | UP | UP | 297000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 7 | 30.2 | NORMAL |
| 7 | UP | UP | 303000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 8 | 30.2 | NORMAL |
| 8 | UP | UP | 309000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 9 | 30.2 | NORMAL |
| 9 | UP | UP | 315000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 10 | 30.3 | NORMAL |
| 10 | UP | UP | 321000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 11 | 30.3 | NORMAL |
| 11 | UP | UP | 327000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 12 | 30.3 | NORMAL |
| 12 | UP | UP | 333000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 13 | 30.4 | NORMAL |
| 13 | UP | UP | 339000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 14 | 30.4 | NORMAL |
| 14 | UP | UP | 345000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 15 | 30.4 | NORMAL |
| 15 | UP | UP | 351000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 16 | 30.5 | NORMAL |
| 16 | UP | UP | 357000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 17 | 30.5 | NORMAL |
| 17 | UP | UP | 363000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 18 | 30.5 | NORMAL |
| 18 | UP | UP | 369000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 19 | 30.6 | NORMAL |
| 19 | UP | UP | 375000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 20 | 30.6 | NORMAL |
| 20 | UP | UP | 381000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 21 | 30.6 | NORMAL |
| 21 | UP | UP | 387000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 22 | 30.7 | NORMAL |
| 22 | UP | UP | 393000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 23 | 30.7 | NORMAL |
| 23 | UP | UP | 399000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 24 | 30.7 | NORMAL |
| 24 | UP | UP | 405000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 25 | 30.8 | NORMAL |
| 25 | UP | UP | 411000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 26 | 30.8 | NORMAL |
| 26 | UP | UP | 417000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 27 | 30.8 | NORMAL |
| 27 | UP | UP | 423000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 28 | 30.9 | NORMAL |
| 28 | UP | UP | 429000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 29 | 30.9 | NORMAL |
| 29 | UP | UP | 435000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 30 | 30.9 | NORMAL |
| 30 | UP | UP | 441000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 31 | 30.9 | NORMAL |
| 31 | UP | UP | 447000000 | DOCSIS | B | 256 | 5361 | I32-J4 | 32 | 31.0 | NORMAL |

| Chan | State | Admin | Mod-Type | Start | Width | PLC | Profile-ID | dcid | power | output | Frequency |
|------|-------|-------|----------|-----------|----------|-----------|------------|------|-------|--------|-----------|
| 158 | UP | UP | OFDM | 600000000 | 96000000 | 645000000 | 22 | 159 | 33.9 | | NORMAL |

Feature Information for Downstream Power Tilt

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the www.cisco.com/go/cfn link. An account on the Cisco.com page is not required.



Note The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 2: Feature Information for Downstream Power Tilt

| Feature Name | Releases | Feature Information |
|-----------------------|--------------------------|--|
| Downstream Power Tilt | Cisco IOS XE Fuji 16.7.1 | This feature was introduced on Cisco IOS XE Fuji 16.7.1 on the Cisco cBR Series Converged Broadband Routers. |

